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**PATENT STATUS REPORT FOR  
BLACK VALLEY LIMITED  
(f/k/a ZEN RESEARCH (IRELAND) LTD)**

**December 10, 2004**

**ZEN RESEARCH (IRELAND) LTD**  
December 10, 2004

Method and Apparatus for Reading Data						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
2185/US/92 DIV I	Edge detection algorithm for determining track centers in wide-area image	08/394,309	02/24/1995		5,598,393 (01/28/1997)	Maintenance Fee Due 1/28/05 + surcharge; 7/28/2008. Expires 01/28/2014.
2185/US/92 DIV II	TDI detector matrix-wide area	08/394,175	02/24/1995		5,574,712 (11/12/1996)	Maintenance Fee Due 05/12/2008. Expires 11/12/2013.

Method and Apparatus for the Simultaneous Writing of Data on an Optical Disk						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
2637/US/93	Parallel write using interference from independently modulated neighboring beams	08/254,187	06/06/1994		5,592,444 (01/07/1997)	Maintenance Fee Due 01/07/2005 + surcharge; 07/07/2008. Expires 01/07/2014.

Optical Disk Reader						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
2871/US/93	LED illumination with TDI matrix-wide area	08/315,432	09/30/1994		5,566,159 (10/15/1996)	Maintenance Fee Due 04/15/2008. Expires: 10/15/2013.

Focusing System and Methods for Multi-Track Optical Disk Apparatus					
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December 10, 2004

DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-002	Asigmatic focus detection for wide-area illumination	08/531,764	09/20/1995		5,708,634 (01/13/1998)	Maintenance Fee due 07/13/2005; 07/13/2009. Expires: 09/20/2015.
ZRI-002 PCT (Designating all States)		PCT/EP96/04110	09/19/1996	WO 97/11460 (03/27/1997)		International phase complete; No National /Regional Applications
ZRI-002 DIV	Focus detection for wide-area illumination using two micro-lenses	08/842,936	04/25/1997		5,774,432 (06/30/1998)	Maintenance Fee due 12/20/2005; 12/30/2009; Expires 09/20/2015.

DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-003 PCT (Designating all States)		PCT/EP96/04947	11/13/1996	WO 97/18560 (05/22/1997)		International Phase Completed; No National/Regional Applications
ZRI-003 FWC	Tracking detection using CCD array having a low integration rate and a serial shifted output (wide area-method claims may support multi-beam)	08/921,459	08/15/1997		5,802,025 (09/01/1998)	Maintenance fee due 03/01/2006; 03/01/2010; Expires 11/15/2015.

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Method and apparatus for high speed digital storage						
BOOK NO.	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-004	Electronics for buffering data from multiple tracks in parallel and reassembling data in serial (wide area and multi-beam)	08/559,429	11/15/1995		5,627,805 (05/06/1997)	Maintenance Fee Due: 11/6/2008. Expires 11/15/2015.
ZRI-004 PCT		PCT/EP96/04970	11/13/1996	WO 97/18561 (05/22/1997)		International Phase Completed; No National/Regional Applications
ZRI-004 CIP 1	Digital PLL - uses pulse having unique pulse width (wide-area and multi-beam)	08/801,397	02/20/1997		5,793,549 (08/11/1998)	Maintenance Fee Due: 02/11/2006; 02/11/2010; Expires 11/15/2015.
ZRI-004 CIP DIV	Digital PLL - deriving individual track clocks from reference data clock (wide-area and multi-beam)	09/013,861	01/27/1998		6,028,827 (02/22/00)	Maintenance Fee Due: 08/22/07; 08/22/11 Expires 11/15/2015.
ZRI-004 CIP 2 PCT		PCT/EP98/00983	02/20/1998	WO98/37554 (08/27/98)		National/Regional Phase Entered:
Japan		10-536267	02/20/1998			Request for exam due 02/20/05.
ZRI-004 CIP 3	Moveable MUX - concurrent signal processing circuitry and	09/013,864	01/27/1998		6,381,210 (4/30/02)	Maintenance fees due 10/30/05; 10/30/09; 10/30/13; expires 2/20/17

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December 10, 2004

Methods and Apparatus for High Speed Optical Storage Device						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
	asynchronous signal processing circuitry (multi-beam)					

Methods and Apparatus for High Speed Optical Storage Device						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-004 CIP 3 PCT	Foreign counterpart to '864 application	PCT/EP98/00984	02/20/1998			Int'l Phase Completed; National/Regional Phase Entered
Japan		10-536268	02/20/1998			Request for exam 02/20/05

Electronic Track Detection Methods for Apparatus for Simultaneously Reading Multiple Adjacent Tracks of an Optical Disk						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-005	Tracking and reading data from multiple tracks by continuously solving simultaneous equations (wide-area)	08/558,805	11/15/1996		5,652,746 (07/29/1997)	Maintenance Fee Due: 1/29/2005, 1/29/2009; Expires 11/15/2015.
ZRI-005 PCT (Designating all States)		PCT/EP96/04971	11/13/1996	WO 97/18558 (05/22/1997)		International Phase Completed; No National /Regional Applications

Methods and Apparatus for Resonant Acoustic Wave Optical Storage Device					
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December 10, 2004

DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-006	Improved seek-time using an elongated detector having multiple sensing elements to detect and count tracks (wide-area)	08/558,835	11/15/1995		5,793,715 (08/11/1998)	Maintenance Fee Due 02/11/2006; 02/11/2010; Expires 11/15/2015.
ZRI-006 PCT (Designating all States)		PCT/EP96/04972	11/13/1996	WO 97/18557 (05/22/1997)		International Phase Completed; No National/Regional Applications

Method and Apparatus for High-Speed Optical Storage Device						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-007	Signals from detector array used for tracking and crosstalk correction; between-track nulling (wide area)	08/559,419	11/15/1995		5,701,283 (12/23/1997)	Maintenance Fee due 06/23/2005; 06/23/2009. Expires: 11/15/2015.
ZRI-007 PCT (Designating all States)		PCT/EP96/04973	11/13/2096	WO 97/18559 (05/22/2097)		International Phase Completed; No National /Regional Applications

Method and Apparatus for Correcting Magnification Error While Tracking Multiple Adjacent Tracks of an Optical Disk						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS

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December 10, 2004

December 10, 2004

Method and Apparatus for High Speed Optical Storage Devices						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-008	Magnification correction for multi-beam read (multi-beam)	08/675,526	07/3/1996		5,729,512 (03/17/1998)	Maintenance Fees due 09/17/05; 09/17/09; Expires 07/03/16.
ZRI-008 PCT (designating all states)		PCT/EP97/03497	07/03/1997			Int'l Phase Completed; No National/Regional Applications
ZRI-008 CIP CPA	Magnification correction for multi-beam reading or writing (multi-beam)	09/037,471	03/10/1998		6,430,125 (8/6/02)	Maintenance Fees due 02/06/06; 02/06/10; 02/06/14; Expires 07/03/16
ZRI-008 CIP2	Magnification correction plus single-sided crosstalk correction (multi-beam)	09/042,185	03/12/1998		5,959,953 (09/28/99)	Maintenance Fees due 03/28/07; 03/28/11; Expires: 07/03/16.
ZRI-008 CIP PCT	Foreign counterpart to '471 application	PCT/EP99/01522	03/09/99	WO 99/46769 (09/16/99)		Int'l phase completed; National phase entered.

Eliminating Multiple Data Tracks on an Optical Disk with a Laser Source or Reduced Chatter						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-009	Non-coherent wide-area illumination	08/676,554	07/08/1996		5,825,743 (10/20/1998)	Maintenance Fee due 04/20/2006; 04/20/2010; expires 2/24/15
ZRI-009 PCT (Designating all		PCT/EP97/03606	07/08/1997			International Phase Complete; No National/Regional

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December 10, 2004

Eliminating Multiple Data Tracks of an Optical Disk with a Laser Source or Reader of Coherence					
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	STATUS
States)					Applications

Improved Optics for Optical Disk Reader/Grating Placement					
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	STATUS
ZRI-019	Multi-beam optical pickup that combines diffractive and holographic elements (multi-beam)	09/027,313	02/20/1998	20020057632-A1	6,411,573 (06/25/02)  Maintenance fees due 12/25/05; 12/25/09; 12/25/13; expires 02/20/18. No foreign filing

DAD DISC Reader					
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	STATUS

Multi-Beam Read Single Beam Write					
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	STATUS
ZRI-022	Multi-beam read/at least single-beam write	09/026,736	02/20/1998		6,314,071 (11/06/01)  Maintenance Fee due 5/6/05; 5/6/09; 5/6/13; Expires 2/20/18.
ZRI-022 PCT	Foreign counterpart to '736 application	PCT/EP99/01074	02/19/1999	WO 99/42993 (08/26/99)	Int'l Phase Completed; national phase entered.
ZRI-022 Japan		2000-532848	02/19/99	2002-504734 (2/12/02)	Request for Exam 02/19/06



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December 10, 2004

ORIGINAL PATENT INFORMATION						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-023 PCT	Foreign counterpart to '803 application	PCT/JP98/04268	09/22/1998			Int'l Phase Completed; National Phase entered in US
ZRI-023 US	Foreign counterpart to '803 application	09/529,500	04/13/2000		6,373,793 (4/16/02)	Maintenance fees due 10/16/05; 10/16/09; 10/16/13; expires 4/13/20
Method and Apparatus for Generating Focus Error Signals in a Mirror-Beam Optical Disk Drive						
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-025	Focus error detection using holographic element with astigmatism (multi-beam)	09/169,212	10/09/1998		6,229,771 (5/8/01)	Maintenance fees due 11/8/08; 11/8/12; expires 10/9/18
ZRI-025 PCT		PCT/EP99/07561	10/08/99	WO 00/22617 (04/20/2000)		International Phase completed; National Phase entered
ZRI-025 Australia		62017/99	10/08/99		755639 (4/3/03)	6 <sup>th</sup> annuity due 10/08/05; expires 10/8/19
ZRI-025 Japan		2000-576449	10/08/99	2002-527853 (8/27/02)		Request for Examination due 10/08/06
Method and Apparatus for Generating Focus Error Signals in a Mirror-Beam Optical Disk Drive						

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DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
ZRI-027	Buffering and re-ordering data blocks for sequential delivery to host computer (multi-beam)	09/159,998	09/24/1998		6,137,763 (10/24/00)	Maintenance Fee Due 4/24/08; 4/24/12; exp. 9/24/18.
ZRI-027 PCT		PCT/EP99/06971	09/21/99		WO 00/17873 (03/30/00)	International Phase completed; National Phase entered.

DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
Method and Apparatus for Reading Multiple Tracks of an Optical Disk Using a Swing-arm Mechanism						
ZRI-029	Using a swing-arm positioning mechanism in a multi-beam optical disk reader	09/373,683	08/13/99		6,449,225 (9/10/02)	Maintenance Fees due 3/10/06; 3/10/10; 3/10/14; expires 8/13/19
ZRI-029 PCT		PCT/EP00/07703	08/08/00		WO 01/13367 (2/22/01)	International Phase Completed; National Phase Entered
ZRI-029 Japan		2001-517382	08/08/00	2003-507831 (2/25/03)		Request for exam due 8/8/07

DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	PATENT NO. & DATE	STATUS
Multi-beam Optical Disk Reader with Detachable and Removable Formers						
ZRI-030 PCT		PCT/EP00/12826	12/15/00			Int'l Phase Completed; No National/Regional Applications

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Methods and Apparatus for Writing Multiple Tracks on Optical Disks					
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	STATUS
ZRI-031 provisional	optical disk drive for writing multiple tracks of an optical disk.	60/260,458	01/08/01		Expired
ZRI-031 US		10/042,653	01/08/02	20030012113-A1 (1/16/03)	Response to 1 <sup>st</sup> Office Action due 11/17/04 (deadline can be extended up to three more months until 2/17/05 with payment of extension fee for each month).
ZRI-031 PCT		PCT/IB02/01662	01/08/02	WO 02/065461 (8/22/02)	International Phase completed; No National/Regional Applications

Methods and Apparatus for Cross-talk and Jitter Reduction in Multi-beam Optical Disks					
DOCKET	SUBJECT MATTER	SERIAL NO.	FILING DATE	PUBLICATION NO. & DATE	STATUS
ZRI-032 US	multi-beam optical disks for reducing cross-talk and jitter	10/045,208	10/23/01	20030076760-A1 (4/24/03)	Response to 1 <sup>st</sup> Office Action due 1/5/05 (deadline can be extended up to three more months until 4/5/05 with payment of extension fee for each month). No Foreign filing

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